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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,785	07/12/2000	Dong-II Cho	00656	2551

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EXAMINER

HASSANZADEH, PARVIZ

ART UNIT

PAPER NUMBER

1763

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4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/614,785

Applicant(s)

CHO, DONG-IL

Examiner

Parviz Hassanzadeh

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 3/14/02 have been fully considered but they are not persuasive.

The Applicant asserts that the purpose of injecting nitrogen is to eliminate internal air moisture from the chamber rather than for preparing a mixed gas including nitrogen. The Examiner argues that the claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function or the intended use and the apparatus of the prior arts of record are inherently capable of being operated as cited in the claims.

The Applicant asserts that the order of injection of the nitrogen into the chambers are different from those cited in the prior arts of the record. The Examiner argues that since the chambers are in communication with each other via inter chamber valves, the apparatus of the prior arts of the record are thus capable of being operated as cited in the claims.

The Applicant asserts that the claimed apparatus includes a means for injecting nitrogen and a means for exhausting nitrogen whereas the apparatus of Patel et al only has a means for injecting nitrogen. The Examiner argues each of the apparatus of the prior arts of the record includes at least one exhausting pump connected to apparatus, see pump 21 connected to the expansion chamber 12 in Fig. 1 of Patel et al or pump 14 connected to the etching chamber 27 in Fig. 1 of McQuarrie et al.

Drawings

The substitute drawing was received on 3/14/02. These drawings are acceptable by the Examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Patel et al (US Patent No. 6,290,864 B1).

Patel et al teach a silicon etching apparatus using XeF₂, the apparatus comprising:

a source chamber 11 containing XeF₂ (*a loading chamber for loading XeF₂*), an *expansion chamber* 12 for receiving XeF₂ gas from the source chamber 11, and an *etching chamber* 14 for performing an etching process on a sample; and

Art Unit: 1763

a first gas source 16 and a second gas source 18 (*a means for injecting nitrogen*) in communication with the expansion chamber 12 for preparing a gas mixture with a ratio about 1:1 to about 500:1 to achieve greater etching selectivity and wherein the non-etchant gas source can be nitrogen (column 6, lines 10 through column 7, line 14; column 8, lines 50-67; and Table in column 8).

Regarding claims 5-7: since the loading chamber, the expansion chamber and the etching chamber are in communication with inter chamber valves 13 and 15, the apparatus is inherently capable of being operated at least manually in the order cited in the claims 5-7.

It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by McQuarrie et al (JP 10-317169 A).

McQuarrie et al teach a silicon etching apparatus (Fig. 1) using XeF₂, the apparatus comprising:

a source room 16 containing XeF_2 (*a loading chamber for loading XeF_2*), a tank 18 (*an expansion chamber*) for collecting XeF_2 gas from the source room 16, and an *etching chamber* 11 for performing an etching process on a wafer; and

an inactive (inert) support gas supply section 15 (*a means for injecting nitrogen*) that mixes with the etching gas before entering the etching chamber 11 (abstract and paragraphs 0001-0010).

The apparatus also including a showerhead as shown in Fig. 1 for uniform distribution of the etchant gas (*an injector having a predefined shape provided in the etching chamber*); and a pressure sources 21 and 22 which are in communication with the source room 16 and tank 18 via a series of valves (*means for feedback controlling the internal pressure of the loading chamber*) in order to maintain a constant pressure within the source room 16 and the tank 18 (paragraph 0011).

Regarding claims 5-7: since the loading chamber, the expansion chamber and the etching chamber are in communication with inter chamber valves, the apparatus is inherently capable of being operated at least manually in the order cited in the claims 5-7.

It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed

Art Unit: 1763

apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Also see MPEP 2114.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over McQuarrie et al (JP 10-317169 A) in view of Sinha et al (US Patent No. 6,123,765).

McQuarrie et al teach all limitations of the claim as discussed above except for a means for measuring the weight of XeF_2 in the loading chamber.

Sinha et al teach deposition apparatus including a gas delivery system 10 wherein a weight scale 24 is used to monitor the weight of the liquid chemical in a bubbler chamber 13.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the weight scale as taught by Sinha et al in the apparatus of McQuarrie et al in order to monitor the weight of the xenon difluoride in the load chamber.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Imai et al (US Patent No. 5,716,494) teach an etching apparatus

Art Unit: 1763

including a gas distribution injector; Chen et al (US Patent No. 4,478,677), Winter (US Patent No. 4,190,488) and Matsui et al (JP 61-134019 A) disclose conventional silicon etching apparatus using xenon difluoride; and Nakagi et al (JP10-209088 A) and Matsui et al (JP 61-181131 A) disclose silicon etching apparatus wherein an inert carrier gas such as nitrogen is used to carry an etchant XeF_2 gas to an etching chamber.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Parviz Hassanzadeh
Examiner
Art Unit 1763

p. h.
April 17, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700